

C3 tack-welded to conductor 580. Centralizer 581 may substantially electrically insulate conductor 580 from conduit 582.

In the Claims:

Please cancel claims 2270-2308 and 5091-5100 without prejudice.

Please add the following claims.

Schulz 5150. (New) ~~A method of treating a coal formation in situ, comprising:~~
~~providing heat from one or more heat sources to at least a portion of the formation;~~
~~allowing the heat to transfer from the one or more heat sources to a selected section of the~~
~~formation such that a permeability of at least a portion of the selected section increases, and is~~
~~greater than about 100 millidarcy; and~~
~~controlling formation conditions to produce a mixture from the formation, wherein a~~
~~partial pressure of H₂ within the mixture is greater than about 0.5 bars absolute.~~

5151. (New) The method of claim 5150, wherein the one or more heat sources comprise at least two heat sources, and wherein superposition of heat from at least the two heat sources pyrolyzes at least some hydrocarbons within the selected section of the formation.

C4 5152. (New) The method of claim 5150, further comprising maintaining a temperature within the selected section within a pyrolysis temperature range.

5153. (New) The method of claim 5150, further comprising controlling a pressure and a temperature within at least a majority of the selected section of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

5154. (New) The method of claim 5150, further comprising controlling the heat such that an

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Sub D1 average heating rate of the selected section is less than about 1 °C per day during pyrolysis.

Sub G1 81 83
5155. (New) The method of claim 5150, wherein allowing the heat to transfer comprises transferring heat substantially by conduction.

Sub D1 81 83
5156. (New) The method of claim 5150, wherein providing heat from the one or more heat sources comprises heating the selected section such that a thermal conductivity of at least a portion of the selected section is greater than about 0.5 W/(m °C).

Sub G1 81 83 89
5157. (New) The method of claim 5150, wherein the produced mixture comprises condensable hydrocarbons, and wherein about 0.1 % by weight to about 15 % by weight of the condensable hydrocarbons are olefins.

90 83
5158. (New) The method of claim 5150, wherein the produced mixture comprises non-condensable hydrocarbons, and wherein a molar ratio of ethene to ethane in the non-condensable hydrocarbons ranges from about 0.001 to about 0.15.

C4 91 83
5159. (New) The method of claim 5150, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

92 83
5160. (New) The method of claim 5150, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen.

93 83
5161. (New) The method of claim 5150, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur.

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~~Sub G1~~ 94 83
5162. (New) The method of claim 5150, wherein the produced mixture comprises condensable hydrocarbons, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

~~95~~ 83
5163. (New) The method of claim 5150, wherein the produced mixture comprises condensable hydrocarbons, and wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

~~96~~ 83
5164. (New) The method of claim 5150, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

~~97~~ 83
5165. (New) The method of claim 5150, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

~~98~~ 83
5166. (New) The method of claim 5150, wherein the produced mixture comprises condensable hydrocarbons, and wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons are cycloalkanes.

~~Sub G1~~ 100 83
5167. (New) The method of claim 5150, wherein the produced mixture comprises a non-condensable component, wherein the non-condensable component comprises hydrogen, wherein the hydrogen is greater than about 10 % by volume of the non-condensable component, and wherein the hydrogen is less than about 80 % by volume of the non-condensable component.

~~Sub G1~~ 100 83
5168. (New) The method of claim 5150, wherein the produced mixture comprises ammonia, and wherein greater than about 0.05 % by weight of the produced mixture is ammonia.

Sub 18 5169. (New) The method of claim 5150, further comprising controlling a pressure within at least a majority of the selected section of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

Sub 19 5170. (New) The method of claim 5150, further comprising altering a pressure within the formation to inhibit production of hydrocarbons from the formation having carbon numbers greater than about 25.

Sub 19 5171. (New) The method of claim 5150, further comprising controlling formation conditions by recirculating a portion of hydrogen from the mixture into the formation.

Sub 19 5172. (New) The method of claim 5150, wherein allowing the heat to transfer comprises substantially uniformly increasing a permeability of a majority of the selected section.

Sub 19 5173. (New) The method of claim 5150, further comprising controlling the heat to yield greater than about 60 % by weight of condensable hydrocarbons, as measured by Fischer Assay.

Sub 20 5174. (New) The method of claim 5150, further comprising producing a mixture in a production well, wherein at least about 7 heat sources are disposed in the formation for each production well.

C4 5175. (New) A method of treating a coal formation in situ, comprising:
providing heat from one or more heat sources to at least a portion of the formation;
allowing the heat to transfer from the one or more heat sources to a selected section of the formation such that a permeability of at least a portion of the selected section increases, and is greater than about 100 millidarcy; and
producing a mixture from the formation, wherein the produced mixture comprises non-condensable hydrocarbons, and wherein a molar ratio of ethene to ethane in the non-condensable hydrocarbons ranges from about 0.001 to about 0.15.

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Subj 112 5176. (New) The method of claim 5175, wherein the one or more heat sources comprise at least two heat sources, and wherein superposition of heat from at least the two heat sources pyrolyzes at least some hydrocarbons within the selected section of the formation.

5177. (New) The method of claim 5175, further comprising maintaining a temperature within the selected section within a pyrolysis temperature range.

5178. (New) The method of claim 5175, further comprising controlling a pressure and a temperature within at least a majority of the selected section of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

5179. (New) The method of claim 5175, further comprising controlling the heat such that an average heating rate of the selected section is less than about 1 °C per day during pyrolysis.

Subj 112 5180. (New) The method of claim 5175, wherein allowing the heat to transfer comprises transferring heat substantially by conduction.

Subj 112 5181. (New) The method of claim 5175, wherein providing heat from the one or more heat sources comprises heating the selected section such that a thermal conductivity of at least a portion of the selected section is greater than about 0.5 W/(m °C).

Subj 114 5182. (New) The method of claim 5175, wherein the produced mixture comprises condensable hydrocarbons, and wherein about 0.1 % by weight to about 15 % by weight of the condensable hydrocarbons are olefins.

Subj 115 5183. (New) The method of claim 5175, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

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Sub G1 5184. (New) The method of claim 5175, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen. *107*

117 5185. (New) The method of claim 5175, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur. *107*

118 5186. (New) The method of claim 5175, wherein the produced mixture comprises condensable hydrocarbons, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols. *107*

119 5187. (New) The method of claim 5175, wherein the produced mixture comprises condensable hydrocarbons, and wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds. *107*

120 5188. (New) The method of claim 5175, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings. *107*

121 5189. (New) The method of claim 5175, wherein the produced mixture comprises condensable hydrocarbons, and wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes. *107*

122 5190. (New) The method of claim 5175, wherein the produced mixture comprises condensable hydrocarbons, and wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons are cycloalkanes. *107*

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~~Sub 1~~ 5191. (New) The method of claim 5175, wherein the produced mixture comprises a non-condensable component, wherein the non-condensable component comprises hydrogen, wherein the hydrogen is greater than about 10 % by volume of the non-condensable component, and wherein the hydrogen is less than about 80 % by volume of the non-condensable component.

~~Sub 1~~ 5192. (New) The method of claim 5175, wherein the produced mixture comprises ammonia, and wherein greater than about 0.05 % by weight of the produced mixture is ammonia.

~~Sub 2~~ 5193. (New) The method of claim 5175, further comprising controlling a pressure within at least a majority of the selected section of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

~~Sub 3~~ 5194. (New) The method of claim 5175, further comprising controlling formation conditions to produce a mixture from the formation, wherein a partial pressure of H₂ within the mixture is greater than about 0.5 bar.

~~Sub 4~~ 5195. (New) The method of claim 5175, further comprising altering a pressure within the formation to inhibit production of hydrocarbons from the formation having carbon numbers greater than about 25.

~~Sub 5~~ 5196. (New) The method of claim 5175, wherein allowing the heat to transfer comprises substantially uniformly increasing a permeability of a majority of the selected section.

~~Sub 6~~ 5197. (New) The method of claim 5175, further comprising controlling the heat to yield greater than about 60 % by weight of condensable hydrocarbons, as measured by Fischer Assay.

~~Sub 7~~ 5198. (New) The method of claim 5175, further comprising producing a mixture in a production well, wherein at least about 7 heat sources are disposed in the formation for each production well.